

# SPECIAL POLICY REPORT 12

## The Economic Rationale for Financial Market Regulation

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*Executive Summary:*

This chapter will develop a theoretical framework that will serve as a positive theory for the appropriate type and degree of regulation in financial markets. The approach is based on the identification of imperfections (such as externalities, incompleteness, failures and asymmetries) in perfectly competitive or laissez-faire financial markets and analyzing how they result in inefficient or non-optimal outcomes. Included in this section is a discussion of the externality of risk, three types of externalities of information, destructive competition, natural monopolies and too-big-to-fail problems. The next step is to explain how certain regulatory measures or government interventions can improve upon the laissez-faire market outcomes. The chapter concludes by showing how under more realistic assumptions about how markets actually operate that financial markets are more efficient, more stable and less likely to transmit disturbances to the overall economy if they are properly regulated.

# INTRODUCTION

In recent years, the policy debate over financial market regulation remains underdeveloped as it too often remains limited to a choice between complete deregulation or no change at all. This situation arises from a dominant economic theory that assumes perfect markets and concludes from them that a completely free market policy is best. Opponents, finding themselves without a coherent theoretical framework, fall back on a “no change” policy as their best defense. In order to remedy this paralysis, this essay is designed to both elaborate a new theoretical framework and to propose a new set of regulatory standards. This theoretical approach is based on identifying the imperfections in financial markets and describing how they are contrary to the assumptions that underlie the conventional economic theory. These new and different assumptions then support different conclusions, namely that financial markets are more efficient, more stable and less likely to transmit disturbances to the overall economy if they are properly regulated. The framework also helps determine the most appropriate set of regulations. In the developing world, extreme free market policies towards financial markets created a new but not unfamiliar financial stumbling block to improved living standards and prosperity.

The economic failure arising from these policy errors put a crack in the “Washington Consensus”.<sup>1</sup> Since that time a good deal of critical thinking has been focused on the international financial architecture and how to reform it. Most of the new thinking has focused its criticism of the policies of the International Monetary Fund (IMF) and the World Bank. Yet the role of national governments in regulating their domestic financial markets, including the role they play internationally, needs just as much attention.

The mainstream economic theory, as it now stands, holds that an unrestricted or laissez-faire competitive equilibrium is the most efficient economic arrangement. This concept is known as Pareto Optimality where production and consumption cannot be reorganized or reallocated to increase the utility of one or more individuals without decreasing the utility of some other.

This theory is built upon assumptions that include: *i*) perfect (atomistic) competition where no individual or firm can exercise market power; *ii*) no externalities<sup>2</sup> so that market prices reflect all private and social costs and benefits; *iii*) information is costless,<sup>3</sup> so that consumers and investors are omniscient regarding market information; *iv*) no destructive competition; *v*) no incomplete markets or market failures; and *vi*) no national security concerns.

## Efficient Market Theory

The idea of a perfectly competitive market was applied to financial markets, and especially securities markets, to produce the notion of “efficient market theory” or efficient market

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<sup>1</sup>) The term Washington Consensus refers to the combination of laissez-faire neo-classical economic theory and the extreme free market ideology build upon it. The term was coined, or the coinage is claimed, by John Williamson of the International Institute of Economics, in Williams, 1990.

<sup>2</sup>) Henderson, James M. and Richard E. Quandt. 1971. *Microeconomic Theory: A Mathematical Approach*, 2<sup>nd</sup> Edition. McGraw-Hill, New York. “The conclusion that perfect competition leads to Pareto-optimal allocations is contingent upon the assumption that there are no external effects in consumption and production.” p.267.

<sup>3</sup>) Again I quote the popular graduate textbook by Henderson and Quandt, “A perfectly competitive commodity market satisfies the following conditions... (3) both firms and consumers possess perfect information about the prevailing price and current bids,” p.104.

hypothesis.<sup>4</sup> One of the seminal authors of the theory, William Sharpe (1970), stated it as follows.

*Simply put, the thesis is this: in a well-functioning market, the prices of capital assets (securities) will reflect predictions based on all relevant and available information.*

This concept holds that securities prices or more broadly all prices established in financial markets, fully reflect all the available and relevant information available to investors. There are many major implications that flow from this point. One is the notion that securities prices follow a random walk. If all relevant information is reflected in the current market price, then only meaningless noise is left to explain price movements. Another implication is that investors cannot systematically beat the market. If all relevant market information, including that about the present and the likelihood of the future, has been used to determine present prices, then any future change in price is unpredictable. Similarly, any price that does reflect the perfectly informed fundamentals will create the possibility of arbitrage profits and in turn arbitrage trading that will drive the price back the level reflecting informed fundamentals. Yet another implication is that prices themselves represent valuable information. This was concisely stated in Stiglitz (2002, p.461) “For more than 100 years, formal modeling in economics had focused on models in which information was assumed to be perfect.”

The policy implication of this laissez-faire economic theory is to justify a complete deregulation of financial markets. In the international context this generated the development policy known as “capital account liberalization” or “neo-liberalism.” Capital controls and many other financial market regulations were eliminated, and capital was allowed to flow unrestricted across borders. In many developing countries, the deregulatory effort ushered in a surge of foreign capital in the form of stocks and bonds, banking lending and a strong rise in foreign direct investment.<sup>5</sup>

This extreme laissez-faire thinking, called “free market fundamentalism” by Joseph Stiglitz and others, was applied to national policy in the U.S. as well as in the developing world. In the U.S., it gave rise to a series of regulatory changes, chief amongst them were: the Gramm-Leach-Bliley Act of 1999 that partially repealed the Glass-Steagall Act requiring the separation of banking and securities activities; a deep and broad scale deregulation of derivatives markets by the Commodity Futures Modernization Act of 2000; and the rule promulgated in 1998 by the Securities and Exchange Commission known as “Broker-Dealer Lite” that lowered the capital requirements for derivatives dealers. The free market fundamentalism also put a stop to regulatory reform efforts that would have prohibited auditing firms from also engaging in consulting business with the same client. But what is perhaps most important is what was not done. Despite the recurrence of numerous and notorious failures associated with hedge funds, derivatives and sharp lending practices such as the promotion of “sub-prime loans,” there was no successful effort to remedy the costly consequences of these financial activities.

## **New Approach to Regulation**

In order that future financial market regulatory policies be directed by reasonable and thoughtful methods that seek the best for the public good, this chapter strives to provide a more critical analysis of the old approach and a more reasonably grounded framework for a new one. The

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<sup>4</sup> ) I will use the term efficient market theory rather than the latter. The best articulation is by Fama (1970) but other seminal articles include Fama (1965), Sharpe (1964), and Lintner (1965) .

<sup>5</sup> ) A portion of the capital flows in the form of equity shares was deemed to be foreign direct investment if an investor held more than 10% of a firms outstanding shares.

approach is to identify inconsistencies between the actual characteristics of financial markets and the assumptions about these characteristics that serve as the foundation for economic theory. If it can be shown where the assumptions are not valid, then the validity of the conclusions will be thrown in doubt. And if the assumptions are altered so as to more accurately reflect to the actual characteristics of the financial markets, then the conclusions which logically follow from these alternative assumptions will be a more valid guide to understanding the world and as the basis for policy making.

What I argue is that there are specific features about financial markets – several of which are inherent to financial markets – that violate the fundamental assumptions of existing economic thinking. In other words, there is a significant difference between the actual characteristics of financial markets and what the mainstream neo-classical economic theory assumes about them. Based on these differences, which amount to market imperfections, short-comings or other failures, it will be shown that financial markets and the overall economy can be made more efficient by the imposition of certain government regulations. This point will be illustrated at several points in the chapter with discussions of some particular financial market regulations in the U.S. and how they reflect this insight into the need to improve upon market outcomes.

The implications from this line of reasoning apply to both developed countries and less developed countries. The difference is that most developed countries are already close to the state of prudential regulation while the less developed countries are not. Part of the problem is the political will and the economic resources required to create and maintain such a regulatory environment. The other part is to enlighten the policy makers in those countries as to the means and merits of financial market regulation.

## **A NEW CONCEPTUAL APPROACH**

This chapter develops a theoretical framework that will serve as a guide for policy analysis and policy making in the area of financial markets. It will develop these ideas by working through a series of assumptions about perfect markets that are in clear contrast with the actual characteristics of those markets. The theory that concludes that perfect competitive markets generate equilibriums that are Pareto efficient assumes the absence of externalities, information costs, destructive competition, monopoly or non-competitive markets, and national security concerns.

It will help identify imperfections, incompleteness or inefficiencies in financial markets that are inconsistent with the assumptions of the efficient market theory, and then propose policies to remedy these faults. Identifying imperfections such as externalities means that there are social costs (such as contagion from credit losses) or benefits (such as the function of information as a public good) that are greater to private costs or benefits such that the market equilibrium will not provide the optimal level of production and consumption. Identifying the presence of non-competitive markets means to recognize that exchanges (whether for stocks or derivatives) are natural monopolies whose control of trading rules and contract design – in which there is a public interest – is not disciplined by perfect competition. Identifying the danger of destructive competition means pointing out the costly effects of fraud and manipulation in the marketplace, and how this behavior should be prohibited and policed in any well functioning and efficient marketplace. And lastly, identifying the public concern for national security means recognizing

that systemic failure would result in such deep and broad social cost that the government would be unable to stand aside and avoid intervening.

The chapter is organized in the following manner. A series of market imperfections are identified, and in each case the imperfection is compared to what is assumed about the market in the ideal view of the efficient market theory. The implications for market efficiency and social welfare are discussed for each market imperfection and the related assumption that is invalidated. And in each case there are a few illustrative examples to point out how certain existing regulatory policies have been adopted with the effect of correcting the market imperfections.

## INVALID ASSUMPTIONS OF PERFECT MARKETS

### The Concept of Externalities

Before proceeding onto an evaluation of the various fundamental assumptions of efficient market theory, it will be useful to review the concept of externalities.<sup>6</sup> Perhaps the most clearly written, and hence often cited, article written on the subject is by Francis Bator (1958) who identifies three types of externalities that lead to five modes of market failures. Those three types of externalities were: ownership or non-appropriability;<sup>7</sup> technical; and public goods.

These three notions of economic externalities are not entirely separate, but they are distinct and identifiable. Any one particular economic activity might best be defined by a single type of externality, and yet another activity might best be defined as possessing the combination of two – or even three – types of externalities. Despite the difficulty in dealing with potentially overlapping descriptions, the definitions are useful in order to understand the sources of economic externality.

The first type concerns the limits of ownership or property rights. It has been referred to by Bator (1958) as “ownership externalities” due to “*non-appropriability*” or inability to enforce ownership rights. This can be illustrated by the classic cases of pollution being an external diseconomy (or economic ‘bad’), and apple-blossoms being an external economy (or economic good) to nearby honey production.<sup>8</sup> It occurs because either ownership cannot be determined or a claim on the ownership cannot be enforced. In the above example, the beekeeper cannot lay claim to any particular bee in the apple orchard, and the farmer cannot protect his ownership of the orchard from use by the bees. Similarly, the ownership of pollutants often cannot be ascertained and therefore the victim cannot enforce against the polluter. Looked at otherwise, external diseconomies, such as pollution, persist where citizens cannot exercise ownership rights

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<sup>6</sup>) This section draws deeply from the work by Francis M. Bator (1958), who draws from Meade (1952), Samuelson (1954, 1955), Pigou (1932), Marshall (1920) and Young (1913). I also benefited from reviewing Ferguson and Gould (1980), Henderson and Quant (1971) and Ellis and Fellner (1943).

<sup>7</sup>) Non-appropriability means that something cannot be owned, that ownership claims cannot be reasonably honored or otherwise enforced. For example, the bees, or at least their activity in collecting nectar and redistributing pollen, cannot be owned.

<sup>8</sup>) The metaphor about the bees and apple-blossoms comes from Meade (1952). Although there are factual problems with the “bee and apple-blossom” story, as attested by such studies as Steven N. Cheung, 1973. “The Fable of the Bees: An Economic Investigation.” *Journal of Law and Economics*, 16, it is nonetheless useful as a metaphor.

for clear, quiet and safe air, space and water. In these cases, the polluter's private cost is much smaller than the social cost.

A non-appropriability externality can lead to an inefficient equilibrium because the potential social benefit (cost) of the resource is greater than the private benefit (cost) so that too little (too much) of the resource will be produced. The discussion below identifies how the non-appropriability of the costs of risk-taking in financial markets can result in there being excessive amounts of risk-taking unless market participants are required to hold capital and post collateral (or margin) in amounts commensurate with their risk-taking.<sup>9</sup>

Another type of externality, known as a *technical externality* or an economy of scale that is *external* to the firm, arises from certain technical arrangements of production. A technical externality can arise from the impact of the level of industry output on the costs of individual firms. Greater output can increase the level of trained employees in the industry, but it can also drive up the cost of inputs. Its effects can be positive or negative. What makes it an externality is that its effects are not price mediated. Another source of technical externality is involves indivisible units of inputs or outputs that result in a non-smooth supply schedule. In financial markets, it can explain how the formation of one market can lead to the formation of another related market, and how this connection can cause faults or problems in one to directly harm the other.

A technical externality in a market can lead to non-uniqueness in the equilibrium price or level of output.

The third type of externality concerns *public goods*. These are defined as goods (or services) in which all agents can consume without diminishing the ability of others to consume them. National security, a public concert and many forms of information and scientific knowledge can be used by economic agents without it diminishing its availability for use by others.

Samuelson (1954, 1955) analyzed how prices in a competitive equilibrium would fail to generate a Pareto Optimal outcome in the presence of public goods. He argued that when public goods are present in the market, then all marginal rates of substitution are equal, and not additive, in the aggregation of consumption and production. No price can achieve Pareto optimality, he showed, because a price high enough to induce production would be a price that would result in insufficient distribution and consumption. Bator (1958, p. 371) put it as follows,

*“The set of prices which would induce profit-seeking competitors to produce the optimal bill of goods, would be necessarily inefficient in allocating that bill of goods.”*

While the discussion of the role of externalities has a long thread throughout the literature on economic theory, and includes many important contributions by the major theoreticians of the 20<sup>th</sup> century, the focus has always been on the production of commodities and to a lesser extent services. There has been little use of this notion in the analysis of financial markets.

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<sup>9</sup>) The terms collateral and margin have the same economic meaning: a performance bond to protect a derivatives counterparty from performance risk that the other counterparty(s) will fail to perform on schedule (or at all). The term margin is most often used in the context of exchange traded derivatives, while collateral is usually used in the context of OTC derivatives. Margin is always in the form of cash or government securities, while collateral is sometimes a less liquid, less secure asset.

There are two notable exceptions. One is the research, by Arrow and others including Stiglitz, of how asymmetric information results in market inefficiency or market failure, especially of the type known as *incompleteness*, in the market for health insurance.<sup>10</sup> As Stiglitz (2002, p.469) stated,

*“Much of the research I describe here focuses on asymmetries of information, the fact that different people know different things.”*

Amidst his 1963 paper, Arrow points out that the production of some types of information yields increasing returns to scale and its properties to consumers have the nature of public goods.

Arrow (1963) concludes from these observations the following,

*“The elusive character of information as a commodity suggests that it departs considerably from the usual marketability assumptions about commodities.” Arrow (1963, p. 946)*

Another notable exception can be found in the line of work begun in the mid-1970s by Grossman and Stiglitz. They focused on how the price system conveys information amongst market participants and on the nature of information as a public good and how an equilibrium in such a market fails to be Pareto optimal. They also focused on asymmetric information and the role it plays in causing moral hazard, adverse selection and credit rationing.<sup>11</sup>

## EXTERNALITY OF RISK TAKING

One invalid assumption is that there are no externalities in the market. One important violation of this assumption is the presence of *external diseconomies from the activity of risk taking*. It is an inherent property of risk taking in financial markets that it can have a material and adverse impact on those beyond the risk taking firm and even the immediate counterparties<sup>12</sup> to the risk taking firm. It becomes an externality when it impacts firms and individuals who are neither counterparties to the transaction nor the firm, and who might not even be participating in the same market.<sup>13</sup> It is inherent in that it is an unavoidable consequence of the risk taking. Like congestion, which is an unavoidable consequence of high levels of population density, it nonetheless creates externalities.

The social cost arising from an individual investor's risk taking is akin to other recognized negative external diseconomies arising from non-appropriability such as the costs of pollution and congestion. The problem arises when the market does not successfully hold an individual or firm responsible or liable for all of the costs or consequences of their actions. Operating a factory costs money, but the market cost does not include the cost of harm done to the environment and the cost of closing down the firm does not include the cost to employees from losing firm-specific human capital. The market and the legal system can hold the individual investor liable for their debt and other contractual obligations such as derivatives, but they cannot be held liable for such harm as disrupting market prices, trading volume, market

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<sup>10</sup>) See Arrow (1963), Pauly (1968b and 1974) and a formal model by Kihlstrom and Pauly (1971).

<sup>11</sup>) Grossman and Stiglitz (1976 and 1980), Grossman (1977), Stiglitz and Weiss (1981), among others. Interestingly, Stigler (1967, p. 291) identifies asymmetric information (although he does not use that term) to explain Keynes' notion of 'lender's risk' in the *General Theory*.

<sup>12</sup>) The counterparty means a firm or individual that is an investor, creditor, vender with an account receivable or the opposite party to a derivatives contract.

<sup>13</sup>) The term *transaction* will be used in this book to refer to a trade or payment involving securities, foreign currency or derivatives) and is distinct from a loan, security issuance or physical investment (i.e. capital flow).

capitalization of other firms in the industry<sup>14</sup> and investment and output in the industry and overall economy.

This externalized cost of risk taking was demonstrated on a macroeconomic level during the emerging market financial crises of the 1990s as *contagion* spread financial market crisis from country to country even when those countries were neither connected by trade or investment flows nor geographically proximate. It was again demonstrated by the collapse of the Enron Corporation in 2001 when the effects of the bankruptcy spread beyond stock and bond holders, employees and immediate creditors.

This is not to say that there is no market discipline governing the amount of risk-taking in financial markets. Some of the cost of other entities' risk taking is internalized by the practice of holding capital. If a firm faces capital requirements, capital will act as a disciplining device by limiting the amount of exposure for a given amount of capital. The benefit of taking on additional exposure must justify the additional cost of raising additional capital. This practice is a matter of regulatory requirement for some firms, while for others it is a matter of good risk management. In either case, competition over the highest returns-to-equity drives firms to economize on capital by minimizing capital for a given level of risk exposure or maximizing exposure for a given level of capital.

However, this internalization of the cost of risk taking is limited to the amount of *direct* exposure to the possibility of default on assets or other obligations by counterparties. Firms do not hold capital based on the risk-taking activities of firms or individuals whose assets they do not own, i.e. who are not direct counterparties; nor do they hold capital based on conditions in the broader market or the overall economy.

Another source of market discipline comes from the pricing of risk in financial markets. According to the capital asset pricing model,<sup>15</sup> financial markets efficiently price securities (and presumably other financial assets and derivatives) according to their risk relative to that of the market as a whole. Given two securities with the same yield, the one whose yield has the higher variance (in comparison to the market) will have the lower price. In this manner the market rewards lower risk securities with a higher price and higher risk securities with a higher yield. However, the discipline from this efficient risk-reward relationship applies only to the direct ownership of the security.

Because the consequences of risk taking can potentially reach beyond direct counterparty exposure and impact those who have no direct exposure to the defaulting party, or even exposure to one of the defaulting party's counterparties, markets cannot perfectly address the externality of risk taking. For example, Enron's collapse pushed down natural gas prices across the U.S. after its counterparties lost their positions and had to replace their short-hedge position on the NYMEX or by selling inventory.<sup>16</sup>

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<sup>14</sup>) See DSC Special Policy Brief on Enron and the Damage Done (2002) on Enron's harmful impact on energy industry.

<sup>15</sup>) See the work of Harry Markowitz on optimal portfolio choice, and that of William Sharpe (1964) on the capital asset pricing model "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk."

<sup>16</sup>) Either Enron was net long in the gas market or the long-hedgers and speculators did not react as strongly in replacing their positions.

Default defines a broader range of events than just bankruptcy, and includes less terminal events such as the temporary failure to perform on an obligation, the failure to perform on schedule or a “failed” trade or settlement.<sup>17</sup> Delayed payments or delays in the delivery of collateral might be small to innocuous in many instances, but they can be critical and very costly in others. Defaults or performance failures affect not only the immediate counterparties, who are supposed to internalize the credit risk of their counterparties, but also other non-counterparties in the market and others who are not in the market.

Competition does not necessarily discipline market participants from taking on more risk or too much risk. Sometimes competition can punish above normal risk taking as more and more investors decline to do business with an exceptionally risky investor. At other times, competition drives down the standard for prudent investing as the competition for higher returns drives investors into riskier investments. In this latter case, competition is seen as pushing investors further out along the capital asset pricing model’s schedule of efficient risk-return relationships so that there is a bias towards market equilibriums at points with higher return but also higher levels of risk taking.<sup>18</sup>

The externality of credit risk extends not just to other individual investors but also to the economy as a whole. This is especially true when disruptions strike financial institutions that are critical to key activities such as the clearing and settlement of payments and securities. Other critical activities include acting as dealers or market makers in key markets for government securities or derivatives in which price discovery occurs. The interlinkages among the largest and most critically important financial institutions compound this problem.

The dangers posed by interlinkages among key financial institutions were made very clear by the failure of Long Term Capital Management (LTCM) in October of 1998. LTCM exposure included \$1.4 trillion in interest rate swaps and options and about \$125 billion in repurchase agreements and most of this was with 13 of the largest banks and broker-dealers in the U.S. and E.U.. The failure froze key financial markets until the Federal Reserve Bank of New York arranged with the financial institutions to coordinate a rescue plan (Dodd 2001a).<sup>19</sup> Even though its business activity was narrowly circumscribed, the failure of LTCM froze the U.S. dollar interest rate swaps market and in turn disrupted the market for corporate bonds, mortgages, mortgage-backed-securities (MBS) and asset-backed-securities (ABS). This turn of events was detailed throughout the business press and can be found by reading through the wire services for the days preceding and following the rescue. The following two excerpts from newswires illustrate the state of the markets at that time.

*Regarding levels, a weekly Morgan Stanley Dean Witter research report Wednesday morning said the market continues to be too fragmented and illiquid to provide generic spread indications a the firm normally does. Capital Market Report, Dow Jones, October 14, 1998.*

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<sup>17</sup>) A “failed” trade is one that is repudiated, and a failed settlement is one where one counterparty failed to deliver the security or payment (this usually triggers fallback arrangements such as a securities loan or repurchase agreement in which the failing party takes a disadvantageous position such as making an interest free loan).

<sup>18</sup>) The capital asset pricing model’s theory (see Sharpe (1964)) of the efficient risk-return relationship is itself dependent upon some strong assumptions. These include the assumptions that investors are risk neutral, there are no externalities of credit losses and there are no institutional market institutions that can lead to systemic failures.

<sup>19</sup>) For a good summary of the rescue see Bob Woodward’s *Maestro*, or my unflattering review of same in *Challenge*, May/June 2001.

*The market believes that LTCM is not the only one on the line. There is still a lot more unwinding to be done as there are still many hedge funds that are holding these positions and would want to get out of them. As a result, one trader said that the gilt/swap spread could easily widen out further by 50 basis points.* Dow Jones International News, October 2, 1998.

Although Federal Reserve Chairman Alan Greenspan did not want to admit that it had actually happened, he did acknowledge the consequences in his testimony before the Banking Committee of the U.S. House of Representatives in October of 1998.

*“Had the failure of LTCM triggered the seizing up of markets, substantial damage could have been inflicted on many market participants, including some not directly involved with the firm, and could have potentially impaired the economies of many nations, including our own.” “Our sense was that the consequences of a fire sale triggered by cross-default clauses, should LTCM fail on some of its obligations, risked a severe drying up of market liquidity,”*

The consequence of risk is a problem because the cost to the individual investor or firm for their risk taking is less than the social cost.

The danger of suffering the externalities of risk taking is made worse by the presence of derivatives, and especially OTC derivatives, because they increase leverage and decrease transparency. Derivatives provide leverage by requiring little or no collateral or margin in order to establish a large amount of price exposure. They are off-balance sheet items that are not reported with the same clarity and detail as securities, loans and other balance sheet assets and liabilities. When used to reduce risk through hedging, they can be of great value by facilitating risk management. When used to acquire risk through speculation, they facilitate greater risk-taking and increase the likelihood of losses being inflicted as an externality upon others.

This point was made glaringly clear, both in the method and the magnitude of the danger, when the failure of the derivatives dealer Enron Corporation in December of 2001 exposed the practice of using OTC derivatives to hide debts, hide losses and fabricate income.<sup>20</sup> It also exposed the inadequate market practice of collateralizing OTC derivatives. The failure showed how a bankruptcy can have an impact beyond the immediate creditors and cause sharp declines in the market capitalization of not only the energy sector but the overall U.S. equity market. One reason was that investors were compelled to presume – in the face of non-transparent trading markets – that almost any firm had a potentially large exposure to Enron. In response, many firms voluntarily announced their losses to Enron because they assessed that the market’s fear of their losses was larger than the fact.

Derivatives and other off-balance sheet activities can be used to distort financial reports so that they no longer fully reflect the firm’s exposure to market risk and credit risk. One telling, but not disastrous, case comes from how gold mining companies used derivatives to acquire such large short positions in gold that when gold prices finally rebounded in 2000, the firms had to report losses instead of gains. Investors who had purchased equity positions in the gold

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<sup>20</sup> ) Randall Dodd. 2002. “The Bigger They Come, The Harder They Fail.” Derivatives Study Center Special Policy Brief. Also see Randall Dodd. 2002. “Untangling Enron.” *Challenge*, March-April.

companies on the assumption that they were taking a long position in gold were shocked to discover such losses.

### ***Protecting the rest of us from the fools***

The externalities inherent in the risk-taking activities in financial markets make it economically necessary for the government to play a role in setting prudential standards. Competitive markets alone cannot and will not do this. The externalities are beyond the reach of market discipline, and in some other cases market competition drives participants to hold less and less capital relative to their exposures. Prudential standards for capital and collateral set a floor on safety and soundness in the markets. This will generate efficiency gains in so far as market activity increases or participants price in this improved systematic risk condition. This economic rationale for a beneficial role for the government is not based on any paternalistic motive. Its aim is not to protect the fools from themselves; rather it is to protect the rest of us from the fools.

Towards this end, some of the current financial market regulations in the U.S. – like those in many other parts of the world – reflect the need to remedy the inability of markets to address the externality of risk taking. Chapter 3 below will elaborate a series of prudential financial market regulations that are designed to discourage excess risk taking and to protect the financial system and overall economy from consequences of market disruptions.

## **EXTERNALITY OF INFORMATION**

A second violation of the assumption that there are no externalities in the marketplace comes from the *externalities of information*. This externality is generated by the price formation process and is inherent in financial markets. Prices are information, and that information has all three characteristics of an externality: ownership; technical; and public goods. Even some non-price market information, such as volume, open interest, put-call ratio, short-interest in stocks, margin debt outstanding, serves as important externalities to other parts of the economy. Each of these three types of externalities will be dealt with in turn, starting with non-appropriability, moving onto technical economies and then finally turning to information as a public good. This was summed up by Stiglitz (2002, p.468),

*"Perhaps most importantly, under the standard paradigm, markets are Pareto efficient, except when one of a limited number of market failures occurs. Under the imperfect information paradigm, markets are almost never Pareto efficient."*

### ***Non-appropriability.***

The first characteristic of externality of information derives from the inability to determine or enforce ownership claims on certain information. Price and market information is like the nectar produced by Meade's apple blossoms<sup>21</sup> which are an externality that is used in the production of honey elsewhere in the economy (Meade 1952). The inability to enforce ownership claims on the resources or the benefits from some activity is called *non-appropriability*. Information about prices is used throughout the financial markets in order to price other assets and derivatives, to make forecasts, to make investment decisions about physical investment plant and equipment and so on. Stiglitz (2002) expressed the idea in the following way,

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<sup>21</sup> ) Meade, J.E. 1952. "External Economies and Diseconomies In A Competitive Situation." *Economic Journal*, Volume 62 (March), pp. 54-69.

*“First, markets do not provide appropriate incentives for information disclosure. There is, in principle, a role for government. And second, expenditures on information may be too great.”*

An excellent illustration of this is how the interest rate swaps market produces prices (interest rates) on the term structure of interest rates and this is in turn used as a benchmark for pricing corporate bonds, MBS, ABS and other credit instruments.<sup>22</sup> Similarly, futures prices from a variety of commodities are used by a wide range of investors – those completely outside the commodity market – as an indicator of future inflation. For example, a bond trader is likely to look at the futures prices for corn and wheat as well as energy and metals in order to form an estimate of future inflation. Accordingly, the prices and options premiums for foreign exchange set in spot and derivatives markets are used in making economic decisions throughout the world.

This is known as the *price discovery* process. Price discovery results in the establishment of prices that are used throughout the economy as the basis for forming expectations and making decisions on consumption, investment, production and commercial trade.

Closely linked to the price discovery process, in fact dependent upon it, is the practice of price basing. When the prices in other markets are used in a very direct way to set prices in other markets, this is known as price basing. For example, the prices of many commodities though the U.S. are set by quoting a basis spread above the prices set on the futures exchange. The price of number 2 yellow corn in Iowa might be priced at \$0.08 below the near month futures price on number 1 yellow corn traded at the Chicago Board of Trade for delivery along the Southern Illinois River. An example from financial markets is how the yields on various credit instruments are quotes as spreads above the interest rate swaps rates and U.S. Treasury security yields.

The information generated from the price discovery process is an externality because, like in the bee and blossom metaphor, no one can enforce the ownership rights to the information.<sup>23</sup> The participants in any market in which price discovery occurs do receive some private benefit from the price information, but the social benefit is larger still. Baumol (1964) defines an externality when A’s activities produce a benefit for B such that the marginal social benefit exceeds the private benefit of A, and that A is not compensated by B for that activity. This externality can cause a competitive equilibrium to fail to be Pareto optimal because not enough of A’s activities will be produced.

The fact that the information contained in market prices plays an important role in markets outside that in which they are established means that there is an externality to those prices. This basic insight is reflected in the laws written to regulate derivatives markets in the United States. Prior to being amended by the Commodity Futures Modernization Act of 2000, the Commodity Exchanges Act read as follows.

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<sup>22</sup> ) See Randall Dodd. 2001. “*Repaying the Federal debt: the impact on financial markets and monetary policy.*” manuscript available at <http://www.econstrat.org/dscfeddebt.htm>. See also, Michael Fleming. 2000. The Benchmark U.S. Treasury Market: Recent Performance and Possible Alternatives. New York Federal Reserve Bank Economic Policy Review, Vol. 6, No. 1.

<sup>23</sup> ) Market participants often try to assert ownership over price information. The New York Stock Exchange once prohibited its members from disclosing exchange prices to anyone outside the exchange, and it also once sued Western Union for selling a ticker-tape machine feed to the ‘curb market’ which was trading off of the exchange prices. Today, the distribution of such information market information is sometimes required by law.

*“‘Futures’ are affected with a national public interest. Such futures transactions are carried on in large volume by the public generally and by persons engaged in the business of buying and selling commodities and the products and byproducts thereof in interstate commerce. The prices involved in such transactions are generally quoted and disseminated throughout the United States and foreign countries as a basis for determining the prices to the producer and consumer of commodities and the products and by-products thereof and to facilitate the movements thereof in interstate commerce. Such transactions are utilized by shippers, dealers, millers, and others engaged in handling commodities ... The transactions and prices of commodities on such boards of trade are susceptible to excessive speculation and can be manipulated, controlled, cornered or squeezed, to the detriment of the producer or the consumer and the persons handling commodities and products and byproducts thereof in interstate commerce, rendering regulation imperative for the protection of such commerce and the national public interest therein.” (Section 3 entitled “The Necessity of Regulation”)*

Incidentally, the new section of the Act is entitled “Protection of the Public Interest” and reads more briefly and less literarily to convey a similar economic message.

*The transactions subject to the Act are entered into regulatory in interstate and international commerce and are affected with a national public interest by providing a means for managing and assuming price risks, discovering prices, or disseminating pricing information through trading in liquid, fair and financially secure trading facilities.*

### ***Technical externality.***

The second characteristic of information externality comes from its technical externality. The term technical externality has traditionally been used to describe how the production at nearby firms in the same industry can generate a skilled labor force that lowers the production costs at any firm that employ those skills. This notion is just as reasonably applied to financial markets where product innovation, liquidity and risk shifting transactions in one market affect the efficiency of pricing and trading in other markets.

One good illustration of the application of this notion to financial markets can be found in the complementarity of several different interest rate derivatives markets. Futures on Treasury securities are traded at the Chicago Board of Trade (CBOT) and futures on eurodollar interest rates are traded at the Chicago Mercantile Exchange (CME). Both are highly liquid markets in which there is an enormous amount of open interest so that investor can depend on getting a good price and as large a position as they need. These qualities enable dealers to make a market in interest rate swaps because they have a close substitute instrument in which they can observe prices and shift risk if their market gets one-sided and their dealer books gets too imbalanced. In order to understand this, consider the dealer’s problem. If market participants make a quantity of hit a dealer’s buy-side, then the dealer will need a place to sell in order to avoid getting too imbalanced (short). If other swaps dealers are not available because they are experiencing the same market activity, then the swaps dealers can move into the above mentioned exchange traded derivatives to replicate a swap on the sell-side. If this alternative were not available to the dealer, it would be much risky to make a market and bid- offer spreads would be higher.

Another good illustration comes from the role that repurchase agreement (repo) markets and securities lending markets play in adding liquidity and reducing the number of “fails” in the clearing process in the cash markets for Treasury securities and equity shares.

### ***Public goods***

The third characteristic of information as an externality is its function as a *public good*. The information contained in financial market prices, like knowledge and research, is a public good because the consumption of that information by one entity does not preclude or reduce the consumption by others. The presence of public goods in a market will prevent the market equilibrium from being efficient, or Pareto optimal, because not enough of the public goods will be produced due to the social benefit in consumption exceeding the private benefit from producing and selling it.

*“[W]here all the relevant information is revealed via the price system, it is clear that there are informational externalities.” Grossman (1977, p. 447)*

Grossman went on to explain that if derivatives prices, or other financial market prices for that matter, were to generate information as an externality then other competing entities would get the information for free. Grossman’s concern was that since the social benefit would exceed the private benefit, then this externality would result in insufficient information being produced.

The problem may go even deeper. In some cases the private benefit of information is depreciated if not eliminated if others act upon it; the private benefit to one firm hoarding the information maybe small compared to the social benefit of all firms having it. If they share the information, it will reduce the private benefit to them as the information becomes priced into the security or activity. As a result, private firms have an incentive to hoard certain types of information about themselves and others and so the information will not be made available to the market.<sup>24</sup> This can occur when markets are structured so that a small core of dealers trade amongst themselves at one set of prices, then trade with a wholesale market at another set of prices and then the wholesale market sells to retail market at yet another set of prices. The dealers generally do not share their price information with wholesalers who do not share it with retailers. This is especially likely in OTC financial markets where price and non-price information is least likely to be widely distributed.<sup>25</sup>

This inability of unfettered markets to produce and employ optimal amounts of information raises concerns about transparency in such a marketplace. Transparency is considered a fundamental condition to improve market efficiency as well as safety and soundness. Yet like other public goods, the social benefit of information is greater than the private benefit of producing it and so too little is produced and consumed. As a result, the competitive equilibrium in the unfettered marketplace has less information to contribute towards market transparency than in a properly regulated market.

### ***Providing for sufficient public goods***

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<sup>24</sup> ) Of course there are other types of information that private entities will pay to distribute through such activities as advertising, direct mail or telephone solicitations and public relations.

<sup>25</sup> ) The growing practice of using electronic brokering platforms for OTC participants to observe quotes, post quotes, or hit or lift existing quotes, has substantially changed the distribution of information in these OTC markets.

In the face of these market imperfections, the government can increase the amount of affordable and available information by establishing reporting requirements for all market participants and especially the dealers and exchanges. This information can then be made available to the public by the government or the reporting entity.

The other way for the government to increase the supply of available information is to employ the necessary resources to collect and distribute information. While private firms are sometimes capable of such collection and distribution, they face substantial difficulties in doing so. One is that a private data firm lacks any authority, other than the offer of cash payment, to coax the information from market participants. Thus market participants will not necessarily provide accurate and up to date information. The private data firm will also lack the complete faith and trust of market participants to protect the proprietary nature of the information they are providing. Financial firms reasonably fear that others will use the information to trade ahead of them or to shave off some of their bid-ask spread. Moreover, a private firm cannot easily establish a legacy so that a data series is consistently collected and distributed over a number of years and into the indefinite future. Sometimes private firms simply do not take the trouble to use scientific methods for surveying the market in order to arrive at the price. Lastly, the private firm must charge a price sufficient to cover its costs and this limits, often sharply, the distribution of the data and thus does not result in a market that is uniformly well informed. In contrast, the government can overcome all these limitations and so it is no wonder that the government is responsible for much of the data collection and distribution today.

The problems with private data collection and distribution listed above are neither hypothetical nor a concern of the past. As recently as the spring of 2002, the American Gas Association (AGA) ceased publishing their weekly survey of natural gas in storage amidst controversy that it was not being released on a timely basis. In response, the Energy Information Administration (EIA) of the Department of Energy stepped up and “promised safeguards to ensure accuracy, confidentiality of sensitive data and a timely release.”<sup>26</sup> Not only was the AGA survey criticized for irregular release times, but its survey method was described as “somewhat self-selected in its coverage.” And whereas the AGA survey was voluntary, the EIA sample survey is mandatory. The EIA promised to design a statistical sample and to achieve a target standard error. The EIA survey will also expand coverage so that it represents over 90% of producing regions and 93% of consuming regions.

### ***Government steps in to assure transparency and provide information***

In the face of these market imperfections, the responsibility falls to the government to step in and set the conditions under which a market equilibrium will be Pareto efficient. Arrow (1996) put this succinctly,

*“Certainly, the government, at least in its economic activities, is usually implicitly or explicitly held to function as the agency which substitute for the market’s failure.”*

In recognition of the important role of information in financial markets and the shortcomings in the provision of such information in free markets, the government has intervened to improve on the situation. Contrary to blanket charges that regulations are inefficient and ill-conceived restrictions on free market activities, regulatory measures can be designed to improve upon the inefficiency of free market outcomes.

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<sup>26</sup> ) Dow Jones Newswire, May 2, 2002.

Here are some examples.

- Prohibition of fraud and manipulation.  
*When the prices are distorted by fraud or manipulation then the externality is a negative diseconomy and the role is akin to that of inflation. Moreover, the availability of that information and its integrity is critical. Financial markets have at times been plagued by false reports and rumors. The movie “Trading Places” illustrated the critical importance of a false Department of Agriculture crop report on oranges and hence frozen orange juice futures.*
- Detect and deter manipulation and fraud in order to protect the integrity of the information embedded in market prices.  
*The government can best exercise market surveillance, which is aided by the requirement that market participants submit large trader position reports, in order to protect the integrity of market prices and the orderliness of trading.*
- Require financial reports and the reporting of prices and other critical market information.  
*Enhance market transparency by increasing the quantity and quality of information available to investors. This proved to be an important feature of the Securities Acts of 1933 and 1934.*
- Supervise and examine financial institutions and report on their condition.
- Collect and help disseminate data.  
*The government is better able than private entities to collect accurate information (enforceable by law), use a consistent methodology to provide price data over a long period of time, and distribute the information in a way that is timely, fair and affordable to all market participants.*

The current policy response has been for the U.S. government to take important measures to improve transparency and the production of market information. In response to the market crash in 1929, the Securities Act of 1933 and the Securities Exchange Act of 1934 improved the quantity and quality of market information by requiring public disclosure and quarterly reporting for the public issuance and trading of securities. It also prohibited false reports on the market for securities and futures.

Similarly, the prohibition against insider trading is based on the economic rationale that markets are efficient when information is equally available and insider information is the opposite of that. In addition, the government funds research, collects data on market fundamentals and distributes it broadly and cheaply. This includes information on prices, output and even crop forecasts. The rationale is that it gives everyone the same access to information about the economic factors that underlie market performance.

The externality of information that extends its importance beyond its immediate market means that fraud and manipulation are not self-policed by the market and that it is a matter of public interest – not just a problem for those who are defrauded or suffer the losing end of the manipulation – because they threaten the integrity of the markets i.e. of the price discovery process. Keep in mind that manipulation does not have to be grand in the old fashion way, but can consist of small changes in prices. If prices of winter wheat are off only 3 cents per bushel, and we produce and sell at home and for export 1,612 million bushels, then it will be a \$48.36 million cut in income for the farmers on the winter wheat crop alone. That same 3 cents applied

to the 9.5 billion bushels of corn would affect income by \$285 million – almost six times the impact. That would equal 1% of the nation’s net farm income for all crops.

Similarly, consider a manipulation of 3 basis points<sup>27</sup> on a new auction of Treasury securities. If the auction was for \$12 billion in 30-year bonds, then the mere 3 basis points would raise the cost of borrowing to the government by \$3.6 million a year or \$43.2 million over the life of the security. If it were paid by the government on all outstanding Treasury securities held by the public, then it would cost the Treasury, and hence taxpayers, \$1.1 billion annually.

Moving along, the U.S. consumes 100 billions gallons of gasoline a year. If the price were distorted by 3-cents a gallon, then it would cost consumers \$3 billion. But perhaps to largest illustration comes not from these hypothetical examples, but from the actual case of the manipulation of copper prices by Sumitomo Bank. That manipulation is said to have cost U.S. consumer over \$20 billion in a market manipulation that stretched over several years.

Other problems arise when the information is not equally available to all. Privately collected information tends to be hoarded or narrowly distributed.

Prospective responses include:

- require more reporting, and collect and disseminate more information on a timely basis
- improve the quality of the information (easier for public entity to do)
- OTC reporting requirements on positions and trading activities
- public access to OTC price quotes and execution prices for all electronic exchanges, brokerages, regulated exchanges and clearing houses.
- improved integrity of financial reports
- improved integrity of private market reports and forecasts

## THE COSTLINESS OF INFORMATION

Another invalid assumption about the perfection of financial markets is that investors are fully informed of all relevant information about the markets. The great proponent of free markets George Stigler recognized that the assumption of fully informed market participants was critical to perfect markets.<sup>28</sup>

*“No market can be perfectly competitive, it is quite true, if the traders are very ignorant of offers and bids because many cases of bilateral monopoly or oligopoly may survive.”  
Stigler (1967, p. 289.)*

In order for market participants to be fully informed, the information must first be available (i.e. devoid of monopoly control) and then accessible at a cost that justifies its beneficial use. However, the actual cost of information is often considerable due to lack of available information or high costs of collection or purchase. Moreover, the cost of information, and the fact the cost is variable, means that information is often asymmetric between market participants and this inequality results in suboptimal or non-efficient market outcomes.

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<sup>27</sup> ) A basis point is one hundredth (1/100) of one percent (1%), or 0.01%.

<sup>28</sup> ) Stigler however thought that information was no different than transactions costs and therefore it would affect prices and price differences in the same manner that transactions costs limit the market’s ability to establish an equilibrium with a single price. On this point Stiglitz (2002) concluded in his Nobel prize address, “Stigler was wrong.”

The existing literature on the role of information in markets focuses on how asymmetric information leads to moral hazard and adverse selection. It addresses such problems as those of insurers who might end up over-insuring customers because the insurers would not know how much existing insurance the customer already possessed or how much they might acquire in the future. This is due to the inability of the insurer to know as much as the customer about their current or planned holdings; in other words, the problem is asymmetric information.

More recently, this thinking raised the concern about transparency. By contrast, the concern with moral hazard in the context of financial market regulation is not based on the cost of information but rather the fact that it is widely expected that investors will be bailed out in the event of a crisis. Stiglitz and Weiss (1981) show that costly information results in credit rationing in competitive equilibrium and that government regulation, such as usury laws, can actually be Pareto improving. Also, information costs explain why bank deposit insurance, combined with a bank supervisor, can be more efficient than a market without deposit insurance.

The efficient market theory, and its Pareto optimal market outcome, depends on the market participants possessing perfect information or all relevant information about the market. The validity of this assumption depends on the cost of information.<sup>29</sup> Fama (1970, p. 383) put it as follows, “*A market in which prices always ‘fully reflect’ available information is called ‘efficient’.*”

Grossman and Stiglitz (1980, p. 404) showed that information cost was critical to the theory. “*We showed that when the efficient market hypothesis is true and information is costly, competitive markets break down.*” Their purpose was not to warn about break downs, but rather to stress the point that information is both critical and is never actually costless – otherwise it would eliminate all arbitrage profits and eliminate many markets because they exist largely for the purpose of making “*publicly available [through prices] the information obtained by informed individuals to the uninformed.*”

Pareto efficiency assumes that everyone in the market has perfectly complete knowledge of market information. In financial markets, asymmetric or unevenly distributed information is a problem. In order for a market to function efficiently, all market participants have all relevant information about that market. However it is economically unreasonable for all customers of financial institutions to have the time to explore, collect and analyze the information necessary to evaluate all the potentially available banks, brokers, mutual funds, insurance companies and pension funds.

### ***The power to collect and disseminate authoritative data***

In that context, one of the useful roles of the government in the financial markets is to provide regulatory supervision in order to attest that the financial institution meets the minimum standards for safety and soundness set for that type of financial firm. It does not guarantee against any one firm’s difficulties or bankruptcy, but it provides useful information that the firm is well managed, that it is meeting its regulatory requirements, its books are properly audited, and that its earnings are properly reported.

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<sup>29</sup> ) Here the price is presumed to include the total (money and time) cost of locating, purchasing, delivering and absorbing the information.

Another related market imperfection is the problem of asymmetric information. This can lead to credit rationing on the part of lenders who cannot obtain sufficient information to prevent adverse selection and cannot restrict (and more to the point enforce restrictions) on all needed constraints on borrowers' behavior to maximize repayment. (Stiglitz and Weiss, 1981)

- Collect and help disseminate data.  
*The government is best able to collect data in an efficient, accurate and non-biased method, and to distribute it in the most egalitarian manner.*

## **DESTRUCTIVE COMPETITION**

Another invalid assumption about financial markets is that there is no *destructive competition*. In order for competition in the marketplace to have efficient and beneficial outcomes, there must be rules in place so that the competitive activities do not extend to destructive practices such as fraud and industrial sabotage.

In financial markets, there is always a real and present danger of fraud. The reliance by markets on prompt, up-to-the-minute information makes markets subject to being defrauded by rumors, false market reports, deceptive sales pitches as well as insider-trading. The reliance on transactions conducted over the phone or internet, and transactions with new and unfamiliar parties makes these markets particularly subject to dishonest trading, misappropriation of funds, and simple theft.

The presence of fraud and other forms of destructive competition will discourage market participation by raising the cost from these dead-weight losses.

### ***The good sheriff***

In response, the government regulators have required the segregation of funds by brokers to protect individual investors' money from misuse by the broker, record keeping requirements, the creation and maintenance of records so as to create an audit trail, accounting rules and know thy customer provisions. Government regulators also prohibit insider trading, false reports on the market, and the use of inappropriate sales methods.

## **NON-COMPETITIVE MARKETS**

Yet another invalid assumption about financial markets is that they are void of non-competitive market practices or non-competitive levels of market concentration. Perfect competition in a market requires that market participants are numerous so that no one of these atomistic firms or consumers is large enough to influence market output or prices.

If a market is characterized by a single producer, or a few producers, then it is susceptible to non-competitive market forces which can potentially exercise their influences over market prices. On the supply side this is known as a monopoly or oligopoly, and on the demand side this is known as monopsony.

In financial markets, the issue of monopoly arises in the privileged position that exchanges, and sometimes market makers or dealers, occupy in the market. Consider the position of exchanges for securities and derivatives. The exchanges are the arena of liquidity. The benefits of liquidity are substantial, and so market participants will gravitate to where the liquidity is greatest. This

movement towards the market with greatest liquidity adds liquidity to that market (and detracts from the less liquid one). This process tends to result in the establishment of a single marketplace. In this way, exchanges are a natural monopoly. The single marketplace will be able to set trading rules and other rules of the market that are neither subject to competitive market forces nor in the larger social interest of fairness or economic efficiency.

Having described the nature in which exchanges are natural monopolies, it must be pointed out that they are subject to various types of competition. The history of the American Stock Exchange is largely the narrative of their struggle to wrestle monopoly control of securities trading away from the New York Stock Exchange. Similarly the futures exchanges in the U.S. have long struggled with “La Salle Street”<sup>30</sup> which was their own version of the curb market or bucket shops.<sup>31</sup>

Today exchanges are being challenged by various new electronic commerce networks (ECNs) such as Instinet and Island. Similarly the futures and options exchanges are being challenged by various new electronic platforms as well as the OTC derivatives market. And on top of this, the exchanges often compete against each other. One of the most dramatic examples of this latter type of competition is in the triumph by the Deutsche Terminboerse to capture the trading volume in the German “Bund” bond futures away from the London International Financial Futures and Options Exchange (LIFFE).

One illustrative counter example is how the Chicago Board of Trade, the Minneapolis Grain Exchange (MGE) and the Kansas City Board of Trade (KCBT) all list wheat futures but do so for different grades. The CBOT contract is based on soft red winter wheat, the MGE is based on hard red Northern spring wheat and the KCBT is based on hard red winter wheat. These future contracts, based on these differences, have been trading along side each other for over one hundred years since they were established in 1859, 1885 and 1877, respectively. They represent less a force of competition than an example of localized monopolies over their segments of the market.

Despite the presence of this competition, the exchanges remain – for all practical purposes – in control of the trading rules in the relevant securities and derivatives. The ECNs compete with the established securities exchanges primarily in after-hours trading and by appealing to small traders and investors with lower commissions. More importantly, traders participate in these markets because they can, at the same time, observe the established exchange prices and thus reassure themselves that they are merely saving commission costs without trading at prices that are away from the established market. In the past, the exchanges reasserted their market dominance over their start-up competitors by denying them access to market prices. Today that tactic is being denied them by regulatory reporting requirements, and so their competitors are successful in pulling away from the established exchanges some of the market trading volume. The role of these competitor ECNs seems destined to remain as the down-market supplier of transactions services and never capture more than a minority share of trading volume.

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<sup>30</sup> ) Norris, Frank. *The Pit*. "The 'sentiment,'" said the market reports, "was bearish"; and the traders, speculators, eighth-chasers, scalpers, brokers, bucket-shop men, and the like--all the world of La Salle Street--had become so accustomed to these "Bear conditions," that it was hard to believe that they would not continue indefinitely.

<sup>31</sup> ) Markham Jerry. 1994. "‘Confederate Bonds’ ‘General Custer’ and the Regulation of Derivative Financial Instruments." *25 Seton Hall Law Review* 1.

Regarding inter-exchange competition, some of this does exist but it is focused primarily on new products such as ADRs and single stock futures and dramatic conflicts over “Bund” trading are rare. The cross-listing of securities is not an uncommon form of competition. However this cross-listing is nearly always across borders and thus the economics of it is supported by the difficulties of settling securities trades across borders in addition to any costs from establishing foreign brokerage accounts. In any event, the end result is generally that only one exchange will succeed in listing a derivative and the vast majority of trading in any one security is concentrated in one established exchange.

In the case of regulated exchanges, the government regulators have often acted as intermediaries between market participants and exchanges in order to address customer concerns. The result has been that the monopoly power of exchanges is sometimes tempered by the need to meet the concerns of all investors and not simply pursue the profit maximizing direction of their members or owners.

## INCOMPLETE MARKETS

Another assumption about the perfection of financial markets that is in sharp contrast to the actual characteristics of financial markets is that there are no incomplete markets. An incomplete market means that the market fails to meet some need or exploit some opportunity by not providing some particular good or service or financial contract (such a contingent contract). One important consequence is to limit or prevent arbitrage in financial markets, and this arbitrage process is critical to assuring that the efficient market theory holds in the presence of some irrational investors.<sup>32</sup>

The general cause of incomplete markets includes situations where either the supply or demand side of the market cannot obtain sufficient trust, assurance, collateral or information so as to sustain their ongoing participation in the market.<sup>33</sup> Incomplete markets are caused sometimes by law or social morality, such as the way that the prohibition on chattel or indentured slavery prevents a market in loans that use labor as collateral. Lenders are reluctant to make large, long-term loans to individuals bases solely on the income earning prospects because they cannot be assured that the individual will work hard to earn the income necessary for loan repayment, and so in the absence of bondage contracts the lender does not participate and the market does not exist. Incomplete markets are also caused by asymmetric information. If one side of the market can neither trust nor adequately observe the other side of the market, then they will not provide services such as insurance or hire employees to produce in remote locations.

Much of the early research on incompleteness in financial markets focused on applying the notion of asymmetric to insurance markets. What prevents more insurance, or contingent claims, markets from emerging is the lack of, or the cost of, keys types of information. Arrow (1963) identified information costs as the basis for asymmetric information and explained how this prevented certain markets from forming.

*“It is impossible to draw up insurance policies which will sufficiently distinguish among risks, particularly since observation of the results will be incapable of distinguishing*

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<sup>32</sup> ) Shleifer (2000, Chapter 1) makes to point repeatedly.

<sup>33</sup> ) Others causes include high initial or capital requirements or other start-up costs, and high transactions costs.

*between avoidable and unavoidable risks, so that incentives to avoid losses are diluted.”*  
(Arrow. 1963)

*“It is probably true that hospitalization and surgery are more under the casual inspection of others than is general practice and therefore less subject to moral hazard; this may be one reason why insurance policies in those fields have been more widespread.”* (Arrow. 1963, p. 962)

Pauly (1968) followed up on Arrow’s research with his analysis of the role of moral hazard and it was caused by shortfalls in information.<sup>34</sup> He argued that more insurance would be offered and at better rates if there were zero costs to information such that insurers could calculate the probabilities of all states of nature and the possible losses in each state.

This implications of incompleteness are larger than space and time allows for treatment in this chapter. In order to mention but a few, incomplete lending markets is the source of much controversy in poor and minority neighborhoods in the U.S. as well as poor and especially rural areas of the developing world. The role of the government in developing the home mortgage market in the U.S. through government sponsored enterprises has on one hand been a triumphal success, but after the institutions have been privatized they are now under attack from competitors. The World Bank has been working for years on a project to provide risk management tools, i.e. derivatives, to producers in developing countries. Similarly, the U.S. government has been trying for years to promote the use of same for small agricultural producers in the U.S.

The presence of incomplete markets is another part of the rationale for the governments role in financial markets. In the absence of a private market providing certain financial services, the government can step in to do so. Arrow (1963. p. 961) stated the point very well almost 40 years ago.

*“The welfare case for insurance policies of all sorts is overwhelming. It follows that the government should undertake insurance in those cases where this market, for whatever reason, has failed to emerge.”*

As mentioned above, the U.S. government set the stage for working class home ownership in the U.S. by sponsoring the firms known as Fannie Mae and Freddie Mac, and the government similarly created a student loan market. The U.S. government is also the sole provider of certain types of crop insurance for agricultural producers. Indirectly, the U.S. government has helped provide some basic financial transaction services to the poor by requiring federally chartered depository institutions to provide certain basic activities, such as cash government checks, for free to everyone.

## **REAL AND PRESENT NATIONAL SECURITY CONCERNS**

The last of the assumptions underlying the existence of perfect markets is that there are no national security concerns. National security is a broader issue than national defense, and so the role of the government in maintaining national security must too be appreciated in that broader context.

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<sup>34</sup> ) Pauly, Mark V. 1968. “The Economics Of Moral Hazard: Comment.” *American Economic Review*, Volume 58, Issue 3 (June), 531-537.

No matter how much responsibility is granted to individuals or no matter how much self-reliance is promised by private enterprises, when troubles becomes big and bad enough, they all turn to the government and demand that prompt action be taken to rectify the problem. Whether it is called an act of God, *force majeure*, “too big to fail” or contagion from foreign economic crises, the government is ultimately responsible for assuring peace and security when the nation is faced with a substantial, widespread economic or social threat. Given this potential obligation, which is likely to lead to the socialization of large amounts of costs from the crisis, the government is prudent to take measures that reduce the risk systemic failure in the financial system and that reduce the vulnerability of the overall economy from disruptions to the financial system.

Even Alan Greenspan, a life-long opponent of government regulation and direct government intervention in the economy justified the Federal Reserve’s role in rescuing Long Term Capital Management in the following statements for the Banking Committee of the U.S. House of Representatives in October of 1998.

*“[The Fed got involved] not to protect LTCM's investors, creditors or managers from loss, but to avoid the distortions to market processes caused by a fire-sale liquidation.”*  
*“Our sense was that the consequences of a fire sale triggered by cross-default clauses, should LTCM fail on some of its obligations, risked a severe drying up of market liquidity.”*

## SUMMARY

The traditional neo-classical assumptions about the economy enabled theoreticians to develop a theory of efficient financial markets that is neat, coherent and logically tight. However the assumptions, especially when applied to financial markets, turn out to be very “strong” or in other words lacking a close and established connection to the known facts. The validity of laissez-faire policy proposals that are built upon these assumptions about perfect markets in turn suffer in so far that the assumptions differ from the actual world to which the policies are applied. In this manner free market fundamentalism has produced extreme laissez-faire prescriptions for financial markets, both in the developed and developing world, and this has produced inadequate regulatory frameworks that have failed both to prevent financial crises and to protect other financial sectors and overall economies from those crises.

In order to improve the living standards for working people around the world, it is imperative that a financial regulatory framework be designed in the interest of their prosperity. In order to do so, the economic analysis that serves as the basis for formulating economic policy must take markets as they are and regulations as they might be.<sup>35</sup> This chapter is a meager beginning. It adds value to the debate not so much by coming up with original ideas but rather by bringing existing ideas together – ideas that were strewn across the economics literature – and then applying them in an orderly way to the issue of regulating financial markets.

In order to demonstrate the usefulness of this exercise, the next chapter will discuss how carefully crafted regulations can improve upon the efficiency of unregulated or so-called “free” markets.

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<sup>35</sup> ) With apologies to Jean-Jacques Rousseau (*Social Contract*, 1762).

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